

AMENDMENTS TO THE CLAIMS

1. (Currently amended) The filter laminate of Claim 21, wherein the bond is A filter laminate, comprising in any arrangement a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

~~a first membrane layer comprising a first membrane, wherein said first membrane is a microporous or ultraporous membrane, said first membrane having a first surface and a second surface, each of said surfaces comprising pores, and a support region between said first surface and said second surface comprising flow channels connecting said pores of said first surface with said pores of said second surface, said first membrane comprising an asymmetric region and an isotropic region, wherein said asymmetric region comprises flow channels that gradually increase in diameter from a point in said support region to said second surface, and wherein said isotropic region comprises flow channels that are substantially constant in diameter from said point in said support region to said first surface;~~

~~at least a second membrane layer comprising a second porous membrane; and~~

~~a bonding layer, wherein said bonding layer comprises a hot melt adhesive heat-bonded to said skin surface of said first membrane layer and to said skin surface of said second membrane layer, and further wherein the filter laminate has a flow rate therethrough such that the filter laminate is configured for separation by filtration.~~

2-6. (Canceled)

7. (Currently amended) The filter laminate of Claim + 21, wherein said support structure asymmetric region of at least one of said first membrane and said second membrane comprises a reticular network of flow channels connecting said pores of said first surface with said pores of said second surface.

8-12. (Canceled)

13. (Currently amended) The filter laminate of Claim + 21, further comprising a third membrane layer.

14. (Currently amended) The filter laminate of Claim 13, further comprising a second bonding layer bond between the third membrane layer and either the first membrane layer or the second membrane layer, wherein said bonding layer the bond between the third membrane

and either the first membrane or the second membrane is a hot melt adhesive heat-bonded to said third membrane layer and either the first membrane or the second membrane.

15. (Currently amended) The filter laminate of Claim 4 21, wherein ~~at least one of~~ said first membrane and said second membrane comprises a polymer selected from the group consisting of polyvinylidene fluoride, polyarylsulfone, polyethersulfone, polyamides, and cellulosic derivatives.

16. (Currently amended) The filter laminate of Claim 1, further comprising a layer comprising a material selected from the group consisting of polyester, polypropylene, polyolefin, polyethylene, nylon, paper, cellulose, glass fiber, and acrylic.

17. (Canceled)

18. (Original) The filter laminate of Claim 16, wherein said material is selected from the group consisting of nonwoven fibrous material, woven fibrous material, web material, sheet material, calendared material, wet laid material, dry laid material, and extruded material.

19-20. (Canceled)

21. (Currently amended) A filter laminate, comprising:

a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

a first membrane, wherein said first membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface are larger than pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface;

a second membrane, wherein said second membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface are larger than pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface; and

a bond between ~~each of said adjacent layers, wherein~~ the skin surface of the first membrane ~~is bonded to~~ and the skin surface of the second membrane, wherein the filter laminate has a higher bubble point than either the first

membrane or the second membrane, wherein a bubble point of the filter laminate is greater than a bubble point of the first membrane layer and the second membrane layer in a skin-to-skin configuration without bonding, and wherein the filter laminate has a greater integrity than a combination wherein the skin surface of the first membrane and the skin surface of the second membrane are adjacent to each other but not bonded to each other, wherein the filter laminate has a flow rate therethrough such that the filter laminate is configured for separation by filtration.

22. (Currently amended) The filter laminate of Claim 1 21, wherein the ~~bonding~~ layer bond is formed from a nonwoven fibrous material, a woven fibrous material, or an open extruded material.

23-24. (Canceled)

25. (Previously presented) The filter laminate of Claim 21, wherein the filter laminate is permeable to water.

26. (Currently amended) The filter laminate of Claim 1 21, wherein the ~~bonding~~ layer bond is a web hot melt adhesive.

27. (Currently amended) The filter laminate of Claim 1 21, wherein the ~~bonding~~ layer bond comprises bicomponent fibers containing both a low melting component and a high melting component, wherein the low melting component melts and forms a bond at a temperature at which the high melting component, the first membrane layer, and the second membrane layer survive unchanged.

28. (Canceled)

29. (Currently amended) The filter laminate of Claim 28 21, wherein the first membrane layer and the second membrane layer have different skin pore sizes.

30. (Currently amended) The filter laminate of Claim 28 21, wherein the first membrane layer and the second membrane layer have same skin pore sizes.

31-34. (Canceled)

35. (Previously presented) The filter laminate of Claim 21, wherein, for at least one of the first membrane and the second membrane, said pores of said open surface have an average diameter at least about 5 times greater than an average diameter of said pores of said skin surface.

36. (Previously presented)The filter laminate of Claim 21, wherein, for at least one of the first membrane and the second membrane, said pores of said open surface have an average diameter at least about 10 times greater than an average diameter of said pores of said skin surface.

37. (Previously presented)The filter laminate of Claim 35, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is from about 0.01 μm to about 10.0 μm .

38. (Previously presented)The filter laminate of Claim 35, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is less than about 0.01 μm .

39. (New) A filter laminate, comprising:

a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

a first membrane, wherein said first membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface have an average diameter at least about 5 times greater than an average diameter of pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface;

a second membrane, wherein said second membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface have an average diameter at least about 5 times greater than an average diameter of pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface; and

a bond between the skin surface of the first membrane and the open surface of the second membrane, wherein an average pore size of the pores of the open surface of the first membrane is larger than an average pore size of the pores of the open surface of the second membrane, wherein the filter laminate has a

flow rate therethrough such that the filter laminate is configured for separation by filtration.

40. (New) The filter laminate of Claim 39, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is from about 0.01 μm to about 10.0 μm .

41. (New) The filter laminate of Claim 39, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is less than about 0.01 μm .

42. (New) A filter laminate, comprising:

a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

a first membrane, wherein said first membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface have an average diameter at least about 5 times greater than an average diameter of pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface;

a second membrane, wherein said second membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface have an average diameter at least about 5 times greater than an average diameter of pores of the skin surface, and wherein said asymmetric region comprises flow channels that gradually increase in diameter from said skin surface to said open surface; and

a bond between the open surface of the first membrane and the open surface of the second membrane, wherein the filter laminate has a flow rate therethrough such that the filter laminate is configured for separation by filtration.

43. (New) The filter laminate of Claim 42, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is from about 0.01 μm to about 10.0 μm .

Appl. No. : **10/603,425**
Filed : **June 24, 2003**

44. (New) The filter laminate of Claim 42, wherein, for at least one of the first membrane and the second membrane, an average diameter of said pores of said skin surface is less than about 0.01 μm .